REMARKS

Reconsideration of the application in light of the above amendment and the following remarks is respectfully requested.

Status of the Claims

Claims 1 - 13 are currently pending in the present application. Claims 1 and 13 have been amended. No new matter is added. Support for the amendments can be found in the specification, for example, at page 10, line 23 through page 11, line 4, page 13, lines 3 and 4, page16, lines 18 - 21 and page 20, lines 18-22.

Rejection under 35 U.S.C. §103

Claims 1-5, 7-8, and 10 - 13 are rejected under 35 U.S.C. §103(a) as being unpatenable over Applicants' Acknowledged Prior Art ("AAPA") in view of U.S. Patent No. 4,137,076 to Hoyer et al. ("Hoyer"). Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA in view of Hoyer and U.S. Patent No. 6,521,477 to Gooch et al. ("Gooch"). Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Hoyer and U.S. Patent No. 4,585,706 to Takeda et al. ("Takeda"). Applicants amend independent claims 1 and 13 to further clarify the nature of their invention, and respectfully traverse these rejections.

Amended independent claim 1 claims:

1. A submount comprising:

> a submount substrate, said submount substrate having a surface roughness R_a that is less than or equal to 0.1 micron and a flatness that is less than or equal to 5 microns; and
>
> a solder layer comprising at least a first metal and a second metal in a specific mass ratio formed on a primary surface of said submount substrate, said solder layer having a thickness that is at least 0.1 micron and is no more than 10

microns, and having a relative density before melting that is at least 80% and no more than 99.9% of the theoretical density of said solder layer.

(Emphasis added)

The Examiner acknowledges that AAPA fails to disclose Applicants' claim elements claiming a relative density of the solder layer before melting that is "at least 50% and no more than 99.9% of the theoretical density of the solder layer." However, the Examiner suggests that one of ordinary skill in the art would have been motivated to combine Hoyer with AAPA in order to modify AAPA to reach this missing claim element. Applicants respectfully disagree with this position.

Hoyer teaches an electrical contact suitable for "high current switching or circuit breaking (see, e.g., abstract of Hoyer). At Col. 3: 14 - 62, Hoyer describes the following process process for producing the disclosed electrical contact:

> Commercial-grade alloy of 50% WC and 50% TiC is obtained in the open market, ... This alloy, as obtained, is in the form of micron-sized particles, and is then thoroughly mixed with silver powder also having a particle size in the micron range. The proportions in the mixture are preferably about 65% alloy powder to about 35% of the silver powder, by weight. ... A portion of the mixed powder, represented in FIG. 2, is placed in a conventional die and subjected to high pressure, for example about 40 tons per square inch. The die is configured to provide the round pellet of FIG. 3, with a serrated area on its upper surface. The pressed part is then preferably sintered at about 1260°C. in a reducing atmosphere, for about one hour, to produce the similar but somewhat smaller pellet of FIG. 4. The sintered pellet is then infiltrated with fine silver, applied in the form of a slug as shown in FIG. 5, in a dry reducing atmosphere. The infiltration time is typically about ten minutes, the time used being a function of the mass of the sintered product. The resultant infiltrated pellet, shown in FIG. 6, should be substantially homogeneous with respect to the distribution of the infiltrating silver, and such as to produce a density of from about 96% to about 98% of the theoretical density of the product. The amount of silver infiltrated is preferably enough so that the total silver content in the contact material at the completion of infiltration is about 50% by weight. Excess pure silver normally remains as a layer (24 in FIG. 6) on the top surface of the pellet. To facilitate brazing of the contact to the arm 14, a layer of a suitable solder may be applied to

the silvered top of the pellet, and momentarily melted and resolidified to form the solder layer 26 (FIG. 7).

(Emphasis added)

Hoyer teaches a process for producing an alloyed contact member which preferably includes silver mixed with tungsten carbide and titanium carbide to provide good electrical conductance for high current applications together with good wear characteristics (see, e.g., Col. 1: 57 - 64 of Hoyer). As described above, Hoyer teaches that the contact member is produced as an alloyed pellet, that is sintered at high temperature (1260 °C) and that has serrations on an upper surface that are then "infiltrated" by a fine silver layer that flows over the upper surface of the heated pellet. The silver layer thereafter functions to receive a solder layer to facilitate brazing the pellet to a contact arm.

Hoyer notes the importance of producing an alloyed pellet product for which the distribution of the silver layer is "substantially homogeneous," and suggests that such an alloyed product, by virtue of its homogeneity (see, e.g., Col. 3: 4 - 11 of Hoyer), should, after infiltration of the silver, "produce a density of from about 96% to about 98% of the theoretical density of the [alloyed] product."

Thus, Hoyer teaches a method for producing an alloyed (WTi)C pellet product (inclusive of the silver (Ag) layer) that achieves a high relative density as a result of the homogeneity of the silver layer and homogeneity of the pellet product. However, and in sharp contrast to Applicants' claimed invention, Hoyer provides no teaching or suggestion with regard to a relative density relating to the solder layer alone. Moreover, the relative density taught by Hoyer is directed to the alloyed pellet after the silver layer has melted to infiltrate the serrated surface, and is clearly not directed to a relative density of the solder layer at a premelt stage. Thus, Applicants

respectfully submit that Hoyer in fact fails to teach or suggest the element of amended independent claim 1 that is directed to teaching a relative density of the pre-melt solder layer.

In addition, Hoyer and AAPA in combination fail to teach or suggest several other elements of Applicants' invention as claimed in amended claim 1, including a submount substrate having a surface roughness R_a that is less than or equal to 0.1 micron and a flatness less than or equal to 5 microns; and a solder layer having a thickness that is at least 0.1 micron and is no more than 10 microns,

Accordingly, Applicants submit that the combination of AAPA and Hoyer fails to teach or suggest all of the limitations Applicants' invention as claimed in amended independent claim 1, and that amended independent claim 1 is therefore not obvious in view of these references. Accordingly, Applicants submit that amended independent claim 1 is allowable. As claims 2 - 12 each depend from allowable claim 1, Applicants further submit that dependent claims 2 - 12 are also allowable for at least this reason.

Amended independent claim 13, like allowable claim 1, is directed to a submount including a solder layer, and also claims a relative pre-melt density of the solder layer that is "at least 80% and no more than 99.9% of the theoretical density of said solder layer." For the same reasons discussed above in relation to the relative density element claimed in amended independent claim 1, Applicants submit that AAPA and Hoyer, alone and in combination, must fail to teach or suggest each and every element of amended independent claim 13. Accordingly, Applicants respectfully submit that amended independent claim 13 is not obvious in view of these cited references, and is therefore allowable.

CONCLUSION

Each and every point raised in the final Office Action mailed August 25, 2006 has been addressed on the basis of the above amendments and remarks. In view of the foregoing it is believed that claims 1-13 are in condition for allowance and it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: September 28, 2006

Respectfully submitted,

By _____

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